

WHAT IS CLAIMED IS:

1. An image forming device capable of providing at least a document reading mode and an image recording mode, the image forming device comprising:

5 a document feeder that feeds a document in one direction in a document feed path for performing a document reading operation in the document reading mode;

10 a recording sheet feeder that feeds a recording sheet in one direction in a recording sheet feed path for recording an image on the recording sheet in the image recording mode;

a single drive motor;

15 a drive force transmission mechanism for selectively transmitting a rotation of the drive motor to one of the document feeder and the recording sheet feeder in accordance with a selected operation mode, the driving force transmission mechanism providing at least a first position and a second position;

20 a first power transmission arrangement drivingly connecting the drive force transmission mechanism to the document feeder at the first position of the drive force transmission mechanism;

25 a second power transmission arrangement drivingly connecting the drive force transmission mechanism to the recording sheet feeder at the second position of the drive

force transmission mechanism, the first power transmission arrangement being disconnected from the drive force transmission mechanism when the second power transmission arrangement is drivingly connected to the recording sheet feeder;

first detection means that detects interruption of feeding of one of the documents and the recording sheet at respective one of the document feed path and the recording sheet feed path; and

a control unit that controls the drive force transmission mechanism for switching power transmission between a first transmission phase where the drive motor is drivingly connected to the document feeder through the first power transmission arrangement and a second transmission phase where the drive motor is drivingly connected to the recording sheet feeder through the second power transmission arrangement, the control unit comprising first changing means for changing a current transmission phase to one of remaining transmission phases when the first detection means detects the interruption.

2. The image forming device as claimed in claim 1, wherein the drive motor is rotatable in a forward direction and a reverse direction; and

wherein the drive force transmission mechanism comprises:

a sun gear including a first gear drivingly engaged with the drive motor and a second gear coaxially and integrally with the first gear;

5 a planetary gear constantly engaged with the second gear and orbitally rotatable about the second gear;

a rotary member concentric with the sun gear and rotatable in a same direction as the sun gear when the sun gear rotates in the forward direction so as to orbitally rotate the planetary gear around the sun gear, and unrotatable 10 when the sun gear rotates in the reverse direction so as to only allow the planetary gear to rotate on an axis but prevents the planetary gear from its orbital movement, the control unit controlling rotational direction of the sun gear and rotational angular position of the rotary member for 15 determining at least first and second stop positions of the planetary gear, the planetary gear being only engaged with the first power transmission arrangement at the first stop position, and the planetary gear being only engaged with the second power transmission arrangement at the second stop position. 20

3. The image forming device as claimed in claim 2, wherein the rotating member has an circumference area formed with a plurality of recesses and projections that are one of indented and protruded in a diametrical direction of the rotating member and alternately disposed with each other, each 25

of the recesses and projections having a specific circumferential length, and the driving force transmission mechanism further comprising a sensor switch connected to the control unit, the sensor switch detecting each of the recesses for 5 detecting angular rotational position of the rotary member.

4. The image forming device as claimed in claim 3, wherein the remaining transmission modes comprise a copy mode, a recording sheet feeding mode, and a recording sheet discharge mode, and

10 wherein the driving force transmission mechanism further provides a third position, fourth position and fifth position; and

wherein the image forming device further comprises:

15 a third power transmission arrangement engagable with the driving force transmission mechanism at the third position for providing the copy mode;

a fourth power transmission arrangement engagable with the driving force transmission mechanism at the fourth position for providing the recording sheet feeding mode; and

20 a fifth power transmission arrangement engagable with the driving force transmission mechanism at the fifth position for providing the recording sheet discharge mode.

5. The image forming device as claimed in claim 4, wherein the plurality of recesses includes at lease five recesses for defining the operation modes.

6. The image forming device as claimed in claim 1,  
further comprising a second detecting means that detects a  
removal of one of the document and the recording sheet whose  
feeding operation has been interrupted, from respective one  
5 of the document feeding path and the recording sheet feed  
path;

wherein the control unit further comprises a second  
changing means that performs switching from the one of the  
remaining transmission phases to a previous transmission  
10 phase during which the first detection means has been de-  
tected the interruption for automatically restoring the  
previous transmission mode.

7. The image forming device as claimed in claim 6,  
wherein the drive motor is rotatable in a forward direction  
15 and a reverse direction; and

wherein the drive force transmission mechanism com-  
prises:

a sun gear including a first gear drivingly engaged  
with the drive motor and a second gear coaxially and inte-  
20 grally with the first gear;

a planetary gear constantly engaged with the second  
gear, and orbitally rotatable about the second gear;

a rotary member concentric with the sun gear and ro-  
tatable in a same direction as the sun gear when the sun  
25 gear rotates in the forward direction so as to orbitally ro-

tate the planetary gear around the sun gear, and unrotatable rotating when the sun gear rotates in the reverse direction so as to only allow the planetary gear to rotate on an axis but prevents the planetary gear from its orbital movement,  
5 the control unit controlling rotational direction of the sun gear and rotational angular position of the rotary member for determining at least first and second stop positions of the planetary gear, the planetary gear being only engaged with the first power transmission arrangement at the first  
10 stop position, and the planetary gear being only engaged with the second power transmission arrangement at the second stop position.

8. The image forming device as claimed in claim 7, wherein the rotating member has an circumference area formed  
15 with a plurality of recesses and projections that are one of indented and protruded in a diametrical direction of the rotating member and alternately disposed with each other, each of the recesses and projections having a specific circumferential length, and the driving force transmission mechanism further comprising a sensor switch connected to the control  
20 unit, the sensor switch detecting each of the recesses for detecting angular rotational position of the rotary member.

9. The image forming device as claimed in claim 8, wherein the remaining transmission modes comprise a copy mode, a recording sheet feeding mode, and a recording sheet  
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discharge mode, and

wherein the driving force transmission mechanism further provides a third position, fourth position and fifth position; and

5 wherein the image forming device further comprises:

a third power transmission arrangement engagable with the driving force transmission mechanism at the third position for providing the copy mode;

10 a fourth power transmission arrangement engagable with the driving force transmission mechanism at the fourth position for providing the recording sheet feeding mode; and

a fifth power transmission arrangement engagable with the driving force transmission mechanism at the fifth position for providing the recording sheet discharge mode.

15 10. The image forming device as claimed in claim 9, wherein the plurality of recesses includes at lease five recesses for defining the operation modes.